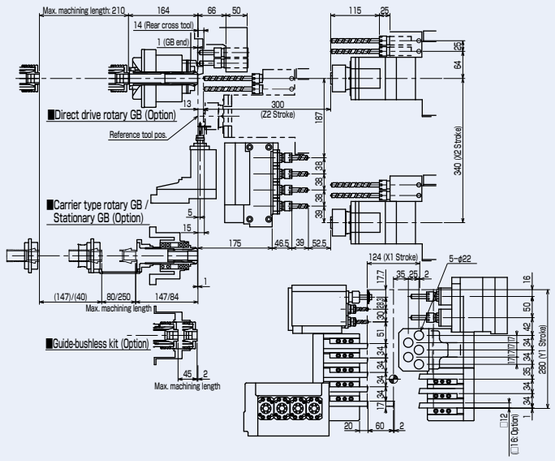
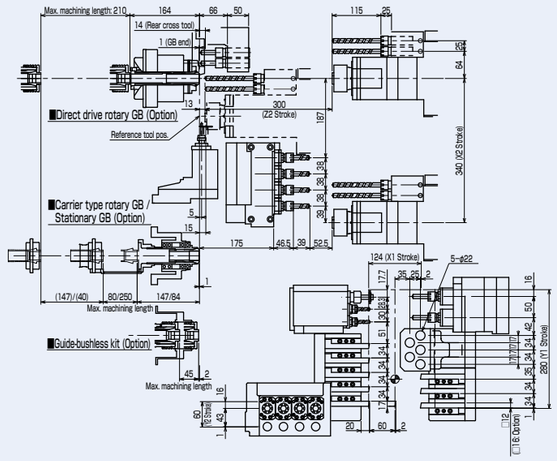
Tooling Zone

S205

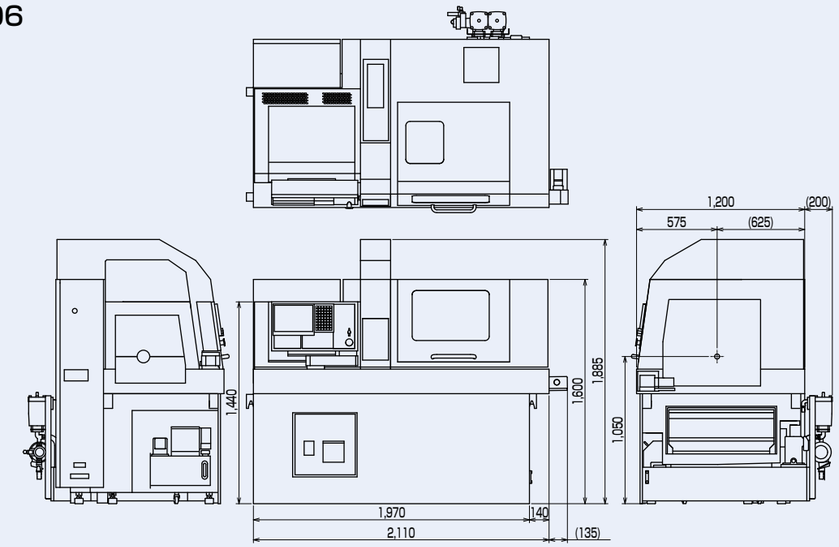


S206



External View

S205/S206



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The specifications of this catalogue are subject to change without prior notice.

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CAT.NO.E114604.FEB.3T(H)

PRECISION TSUGAMI

CNC Precision Automatic Lathe

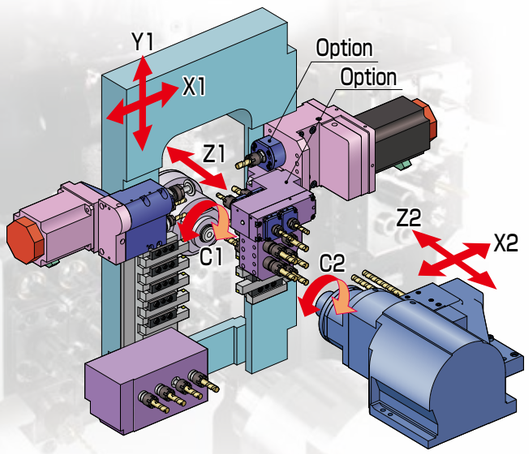
S205/206

Premium capability and performance,
at an economical price.
Multifunction Swissturn with reliable,
productivity-enhancing gang tool post.
Suitable for variable volume production
with a wide range of capability.

Simultaneous machining of main/back spindle

S205

Standard

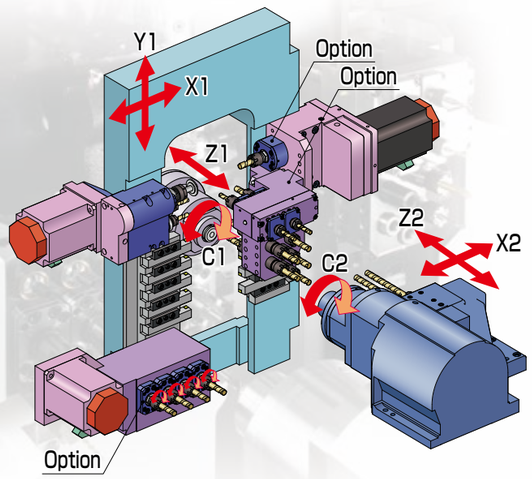


Number of tools	35
OD tool	8
Cross drill	5
Front rotary tool	0 to 4
Front drill (standard)	5
Front drill (deep hole)	2 (100 mm)
Back tool	4 to 13 (back 4 + front drill 5 + double face 4)

Simultaneous complex machining of main/back spindle

S205

With back drive

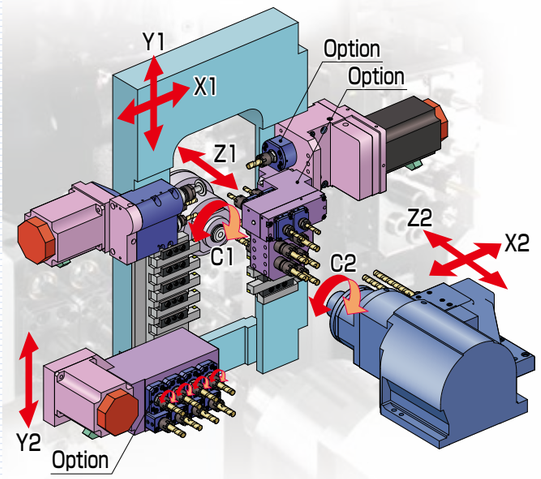


Number of tools	35
OD tool	8
Cross drill	5
Front rotary tool	0 to 4
Front drill (standard)	5
Front drill (deep hole)	2 (100 mm)
Back tool	4 to 13 (back 4 + front drill 5 + double face 4)

Simultaneous complex machining of main/back spindle with Y axis

S206

With Y axis of back tool post



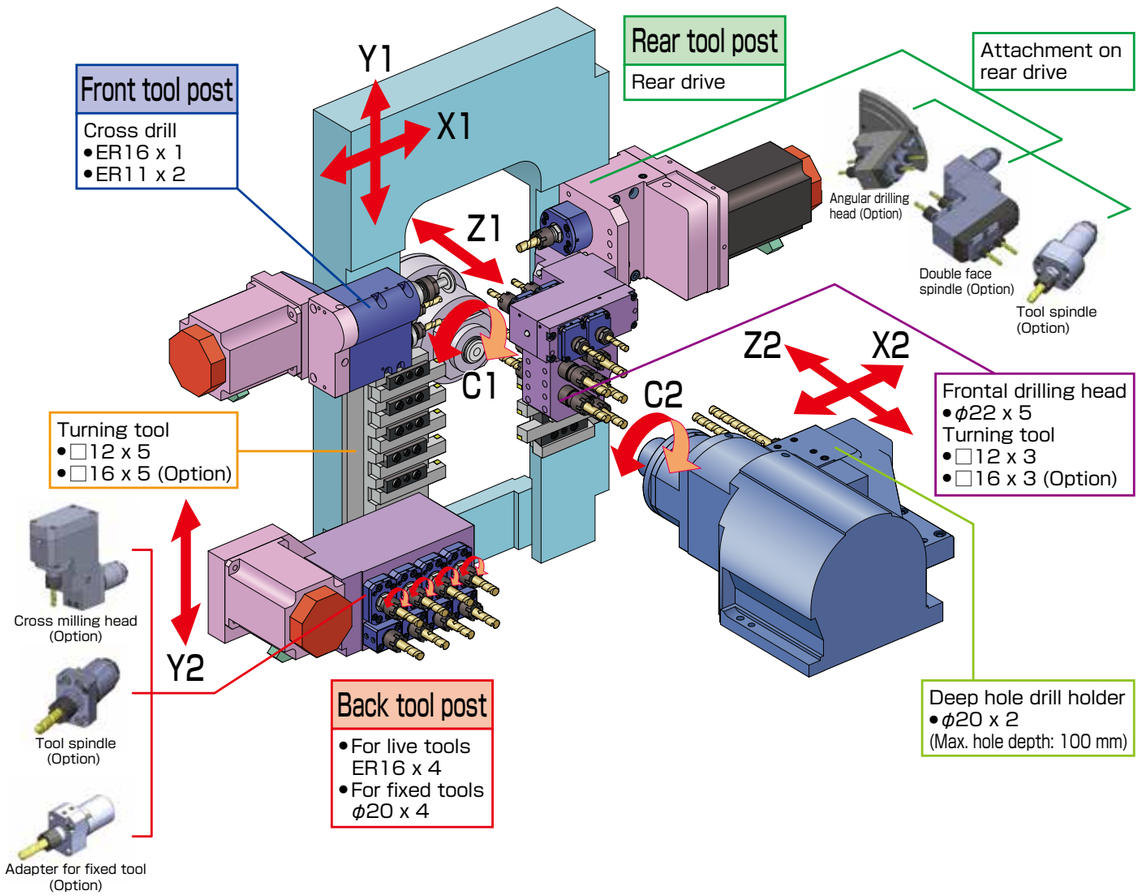
Number of tools	39
OD tool	8
Cross drill	5
Front rotary tool	0 to 4
Front drill (standard)	5
Front drill (deep hole)	2 (100 mm)
Back tool	8 to 17 (back 8 + front drill 5 + double face 4)

1. Machine complex parts using main and back spindle simultaneously with Y axis tool post (S206).
2. Modular tool zone uses cartridge type live tools for optimum allocation of machining capability.
3. Beside the back spindle, additional tool post is attached. Deep hole drilling (up to 100mm) can be realized.
4. Direct-drive rotary guide bushing provides high speed and accurate machining. (Option)
5. Guide-bush type or guide-bushless type is selectable according to workpieces. (Option)
6. Minimum tool change time is achieved with the optimized tool path made by the automatic programming system.

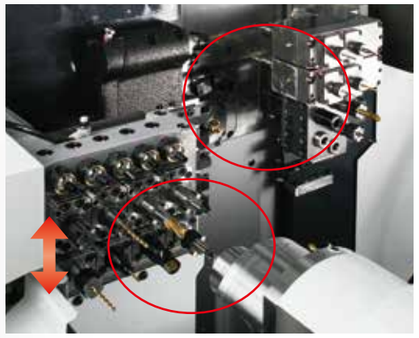
Note: Options are attached on the picture above and the figure shown left.
Options:
Rear tool post: Tool spindle, Double face spindle
Back tool post: Tool spindle

Modular tooling

Free arrangement of rotary tools, ID holders and turning holders



Machine complex parts using main and back spindle simultaneously with Y axis tool post (S206).
Flexibly respond to workpieces requiring complex back machining.



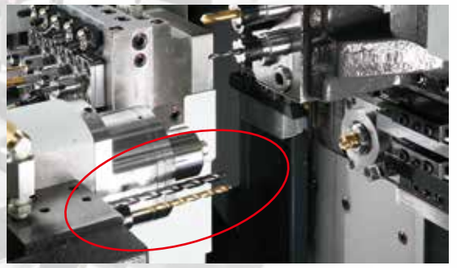
Modular tool zone uses cartridge type live tools for optimum allocation of machining capability.

Rear tool post	Back tool post
Cross tool spindle	Tool spindle
Double face spindle	Cross milling spindle
Angular drilling head	Adapter for fixed tool, etc.
Additional drill holder, etc.	

High speed and accurate machining with direct-drive rotary guide bushing (option)

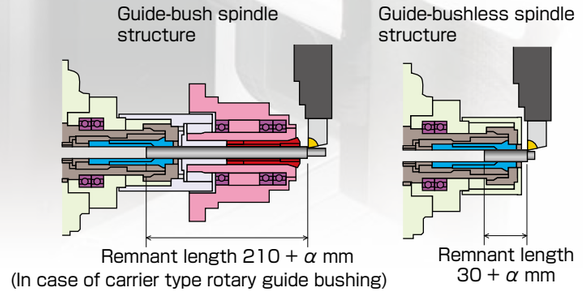
■Max. speed: 10,000 min^{-1} ■Machining length: 210 mm
The geometrical accuracy, the dimensional accuracy and the surface roughness are improved by the quiet operation even on high speed.
*Water-soluble coolant is not available.

Beside the back spindle, additional tool post is attached.
Deep hole drilling (up to 100 mm) can be realized.



Guide-bush type or guide-bushless type is selectable according to the workpiece (option)

■Possible to switch between the guide-bush type and guide-bushless type. Most suitable system for the workpiece can be chosen.
■The guide-bushless type does not require ground bars, enabling high speed and high precision machining from cheap cold-drawn bars.

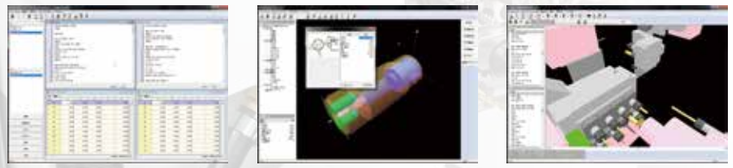


Simultaneous operation with Y axis by using the back cross milling spindle (option)

Back slotting

Back cross drilling, back cross milling

Minimum tool change time is achieved with the optimized tool path made by the automatic programming system.



Matching of machine, tooling and software are preferentially applied. Creating high quality standardized programs suit for complex or high accuracy workpieces.

The program created by the automatic programming system allows an optimum matching of both paths, and shortens the cycle time.
The 3D simulation function enables the user to check the operations of the main/back spindles from any angle.

High-rigidity bed

■The bed is indispensable for high-speed, high-accuracy machining. FEM analysis was used to produce a bed design with maximum rigidity.

Direct C-axis indexing

■When the spindle indexes from the rotation, it stops at the indexing position. Therefore, the reference position return becomes unnecessary, and indexing time is shortened.

Standard Specifications of Machine (Standard Specifications)

Name		S205	S206
Machining range, Machine capacity	Chucking barstock dia.	ϕ3 to ϕ20 mm	
	Max. machining length	210 mm (Direct-drive rotary guide bushing), 250 mm (Static Guide bushing), 80 (Carrier type rotary guide bushing)/45 mm (Guide bush less)	
	Max. drilling dia.	ϕ10	
	Max. tapping dia.	M8	
	Deep hole drilling dia.	ϕ8	
	Max. back spindle chucking dia.	ϕ20	
	Max. back spindle drilling dia.	ϕ8	
	Max. back spindle tapping dia.	M6	
	Max. tool spindle drilling dia.	ϕ6 (Front tool post/Back tool post)/ϕ8 (Rear tool post)	
	Max. tool spindle tapping dia.	M5 (Front tool post/Back tool post)/M6 (Rear tool post)	
	Max. tool spindle slotting cutter dia.	ϕ30 (T1)	
Machine	Main spindle speed	200 to 10,000 min^{-1}	
	Back spindle speed	200 to 12,000 min^{-1}	
	Rotary guide bushing	200 to 8,000 min^{-1} (Carrier type)/200 to 10,000 min^{-1} (Direct-drive)	
	Tool spindle speed	200 to 8,000 min^{-1}	
	Total tool storage capacity (Standard/Max.)	24 pcs/35 pcs	28 pcs/39 pcs
	Tool size	12 mm x 12 mm x 100 mm	
	Rapid traverse rate	32 m/min (X1,Y1: 24 m/min) (Y2: 15 m/min)	
Motors	Main spindle	2.2/3.7 kW	
	Back spindle	1.5/2.2 kW	
	Tool spindle	0.75 kW (Front tool post) 1.0 kW (Rear tool post)	
	Rotary guide bushing	0.75/1.1 kW (Direct-drive rotary guide bushing)	
	X1・X2・Z1・Z2・Y2 axes	0.5 kW	
	Y1 axis	0.75 kW	
	Coolant pump	0.4 kW	
	Lubricating pump	3 W	
Power supply, etc	Weight	3,200 kg	3,300 kg
	Power source requirements	14.3 kVA	
	Compressed air requirement	0.4 MPa or above	
	Air discharge rate	40 NL/min	
	Width x depth x height	2,110 x 1,200 x 1,885 mm	

Standard NC Specifications

Item	S205	S206
NC unit	FANUC 32i-B	
Controllable axes	X1,Z1,Y1,X2,Z2,C1,C2	X1,Z1,Y1,X2,Z2,Y2,C1,C2
Axis composition	X1-Z1 (Simultaneous control), Z1-Y1 (Simultaneous control), X2-Z2 (Simultaneous control), X1-Z2 (Simultaneous control), Z1-Z2 (Axial synchronized control), Z2-Y2 (Simultaneous control)	
Least input increment	0.001 mm (Diametrical designation for X1,X2 axes)	
Least command increment	X1,X2 axes 0.0005 mm Other axes 0.001 mm	
Maximum commandable value	±8 digits	
Interpolation method	Linear/circular	
Rapid traverse rate	32 m/min (X1,Y1: 24 m/min) (Y2: 15 m/min)	
Cutting feed rate	1 to 6,000 mm/min	
Feed rate override	0 to 150 %, 10 % step	
Dwell	G04 0 to 99999.999	
Absolute/incremental command	X, Z, Y, C: Absolute U, W, V, H: Incremental	
Amount of tool offset	±6 digits	
No.of tool offsets	99	
LCD/MDI	10.4" color LCD	
Display language	English	
Part program storage size	64 Kbyte (equivalent to 80 m tape for each path system)	
No.of registerable programs	63	
Miscellaneous function	Main: 5-digit, Back: 3-digit	
Spindle function	S5 digits	
Tool function	T4 digits	

Machine standard accessories

Item	Item
Front tool post: 3-spindle cross drill	Door interlock (Tooling zone side door/Main spindle side door)
Rear tool post: Rear drive	Coolant level switch
Deep hole drill holder (ϕ20 x 2 holes)	Spindle cooling unit
C-axis control for main/back spindles	Standard tools
Automatic programming system	Transit clamps
Tool-height displacement compensation	Automatic power shut-off
Tool counter	Back spindle air purge
Periodic maintenance screen	Cross drill air purge
Main spindle adapter	Back drive (Applicable only for S206)
Back spindle adapter	Main spindle brake

NC standard accessories

Item	Item
Chasing function	Programmable data input
Continuous thread cutting	Chamfering and corner R
Manual pulse generator	Tool nose radius compensation
Memory card I/O interface	HRV control
Back ground editing	Multiple repetitive cycle
Run time/parts number display	Expanded program editing
Custom macro	Canned cycle for drilling
Constant surface speed control	Rigid tap (Main spindle, back spindle, cross/back tool)
Spindle synchronous control (Rotary, phase)	Cut-off detection (Differential)
Z1/Z2-axis synchronous control	Spindle speed fluctuation detection
Tool geometry / wear offset	

Option

Item		Item		Item	
Guide bushing	Stationary guide bushing	Work discharge system	Work conveyor	NC function	Variable-lead thread cutting
	Carrier type rotary guide bushing		Work catcher		Thread cutting cycle retract
	Direct drive guide bushing		Front discharge		Number of registrable programs expansion 1
	Guide-bush-less kit		Rear discharge		Standard program storage size: 120 programs
Advanced function system	Main spindle 15 degree indexing	Chip disposal	Chip conveyor		128 KB: 250 programs
	Back spindle brake	Operation support functions	Automatic tool setting		256 KB: 500 programs
	Back spindle 15 degree indexing		Set gauge		512 KB: 1000 programs
	0.1μm specification	Machine maintenance and monitoring functions	Tap breakage detector		Polar coordinate interpolation
Live tools (Rear tool post)	Tool spindle		Signal indicator		Cylindrical interpolation
	Double face spindle	Tooling parts	Main spindle adapter		Display language
	Angular drilling head		Back spindle adapter	Safety and other	External illumination
	Thread whirling head		Drill holder		Internal work light
Live tools (Back tool post)	Back drive (S205)	NC function	RS232C interface		Automatic fire extinguisher
	Tool spindle		Inch/metric conversion		
	Cross milling spindle		Abnormal load detection		
	Back tool adapter		Part program storage size 128 Kbyte		
Coolant system	High-pressure pump (1.5 MPa)		Part program storage size 256 Kbyte		
	High-pressure pump (2 MPa)		Part program storage size 512 Kbyte		
	High-pressure pump (4 MPa)		G-code system B/C		
	M code oil blow		Stored stroke check 2,3		
	Oil-mist separator		Direct drawing dimension program		

Work catcher

Conveying the workpiece discharged from back spindle through the chute

Angular drilling head

Inclined drilling can be performed

Back cross milling spindle

Thread whirling head

Processing bone screws or long threads